

Fast Cure Repair Kit for Composites, Phase I

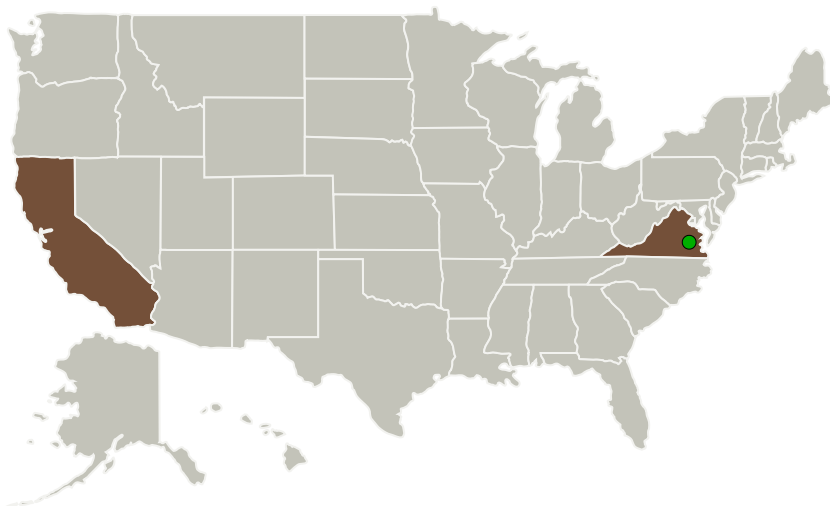
Completed Technology Project (2010 - 2010)



Project Introduction

NASA has a need for technologies that will enable them to repair damage to composite structures. Fiber-reinforced polymer composite materials are fast gaining ground as preferred materials for the construction of aircraft and spacecraft. In particular, the use of composites as primary structural materials in several technology-demonstrator front-line aerospace projects worldwide has provided confidence leading to their acceptance as prime materials for aerospace vehicles. Respectively, materials and tools that can provide rapid, permanent or temporary repairs of composite structural damage in a space environment should follow the wide utilization of composites in airspace vehicles. This proposed project will result in the development of a fast cure repair kit for composites (C-kit) that will consist of the basic composite fabric preimpregnated (preg) with an ultraviolet (UV) light-curing resin, a dispenser containing UV curable resin with properties close to the basic matrix resin, and a battery-operated portable, efficient single light emitting diode (LED) as the source of UV radiation. The prepreg material, which will be in the form of tape and precut patches, and the resin will be stored separately in protective dispensers. The cure of each layer of repair material will take less than a minute. Surface cleaning materials will also be included in the kit. In this project, IOS will collaborate with a manufacturer devoted specifically to the development of UV cured adhesives for specific high end applications. This work will extend the knowledge and experience previously attained by the IOS/ SGL team in the development of light-curing adhesives for Navy ships corrosion protection and for corrosive barrier restoration in Navy fleet composite materials.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Intelligent Optical Systems, Inc.	Lead Organization	Industry	Torrance, California
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Transitions

**January 2010:** Project Start**July 2010:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/139001>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Intelligent Optical Systems, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

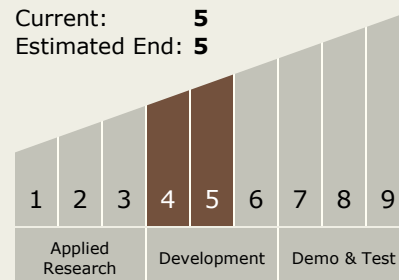
Carlos Torrez

Principal Investigator:

Jesus Delgado Alonso

Technology Maturity (TRL)

Start: 4
 Current: 5
 Estimated End: 5



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.6 Materials for Electrical Power Generation, Energy Storage, Power Distribution and Electrical Machines

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System